

CHAPTER 14

TECHNICAL ADMINISTRATION

Visual communication procedures and doctrine exist only to help Signalmen perform their duties. Procedures and doctrine can be taught through on-the-job training, but this method is usually unsatisfactory because procedures are learned only as different situations arise. Classroom instruction and drills are less expensive for hours spent and results achieved. This is because methods, procedures, and safety precautions must be taught in their order of importance or in some other logical order that will aid the trainee in committing them to memory.

Your training program should include complete information on message forms, operating signals, prosigns, visual responsibility, flashing light, semaphore, and flaghoist. Circumstances, however may dictate the priority you give to each subject. If you have a well-established training program and personnel with experience, follow the program in its planned sequence. By so doing, you assure the widest possible degree of coverage during the ship's regular training cycle. If, on the other hand, you have a group of inexperienced people and you are setting up a new training program, you will find it profitable to alter your training program. Emphasize those subjects of immediate importance and ignore, for the time being, those portions that are less urgent.

The Commanders-in-Chief, Atlantic and Pacific Fleets, have primary responsibility for the tactical training of naval forces. Naval vessels can expect a comprehensive assessment by Afloat Training Groups (ATGs) to include a review of future training requirements, current training programs, personnel billeting, and material/equipment status to assist them in preparing a unit training package. Another phase of this review will be performance based. Information on assessments can be obtained from the ATG prior to its commencement. Another source of information is COMNAVSURFLANTINST/COMNAVSURF-PACINST 3502.2A.

In this chapter, you will learn about drills and exercises, standing orders, and operation orders and plans.

DRILLS AND EXERCISES

LEARNING OBJECTIVES: Describe the procedure for grading and critiquing visual drills and exercises. Explain the importance of security when participating in visual drills and exercises.

Drills and exercises are a large part of the communications department's training program. Noncompetitive exercises and emergency drills are performed to acquaint personnel with correct procedures and methods to increase their efficiency. Competitive (graded) exercises are performed when they are assigned by the type commander or other competent authority. Results of these exercises are used to keep the type commander informed of the readiness state of individual units. Maximum benefit is derived when an exercise is observed and analyzed by the umpires and various assistants who are assigned by the officer scheduling the exercise (OSE).

Strike Warfare (STW), Antisurface Ship Warfare (ASW), Intelligence (INT), Electronic Warfare (ELW) and Command, Control and Communication Exercises (CCC), FXP 3, lists exercises that are designed for visual communications or have visual communications as a part of the overall exercise. These exercises include Flaghoist, CCC-15-SF; Flashing Light, CCC-16-SF; Semaphore, CCC-17-SF; and Comprehensive Communications Assessment, CCC-27-SF. Each of the exercises has its own system of grading. You should be aware of these systems to detect discrepancies when observing an exercise. Remember, observation of personnel during an exercise is a method of determining what area needs more intensive training. For visual communications grading sheets, see chapter 14 of FXP 3.

CRITIQUES

A *critique* is a critical review of an exercise held in the form of a conference. All graded exercises should end with a critique, attended by the umpire, assistants, and key personnel of the unit being graded.

You should become familiar with critiques and derive maximum benefit from the one you attend as a member of the exercise ship so you can present meaningful appraisals.

During the exercise, observers must keep a chronological record of the events that take place or make notes of occurrences that may have a bearing on the outcome of the exercise, such as the following:

- Procedural errors
- Handling times
- Outstanding performances
- Equipment failures and repairs

The important aspects of each observer's notes are presented as a part of the critique. The following points about the exercise should be covered:

- Manner of performance
- Errors committed
- Deficiencies of material or procedure
- Recommendations for improvements of material and personnel performances

The last point, recommendations for improvements, may be more important than any other item because improvement is the goal of all training. Recommendations may be limited to minor changes in procedures or to training in a particular area. Conversely, they may encompass overhaul of entire systems and addition or replacement of equipment.

Tentative grades may be assigned at critiques. Final appraisals, however, are the responsibility of the type commander, who can compare the performance of one unit with another. The type commander also strives for uniformity of grading within the type.

VISUAL COMMUNICATIONS (CCC-15-SF THROUGH CCC-17-SF)

Visual communications exercises may be used for day-to-day training and evaluations or as the criteria for operational readiness inspections (ORIs). For all exercises, preparation and execution must be oriented toward training. It is intended that various communications exercises from FXP 3 be performed in combination to test all installed systems and functions. The operational or type commander designates the exercises for your ship. During periods of emission control (EMCON), visual signaling may be the only method of communications available.

Therefore, proficiency in visual communications must be maintained. The series of visual signaling exercises (CCC-15-SF through CCC-17-SF) is designed to train and evaluate personnel in visual signaling procedures.

COMMUNICATIONS EVALUATION

The visual communications exercises may be used individually or in combination to satisfy the following evaluation requirements: training, ORI, predeployment COMM/ELEX inspection, and overall communications exercises.

The officer conducting the exercises (OCE) supplies the following information:

1. Where: Ship's name, location (in port/under way)
2. When: Starting time and duration of exercise(s)
3. Which: What exercises and for which installed system(s)
4. Who: The senior observer

Any additional comments required will be issued so the exercise unit will be fully prepared.

GRADING

The number of points assigned for each evaluation factor is the norm. However, the senior observer may deduct points to the degree that circumstances show a need. Additionally, if performance or material readiness is of exceptionally poor quality, the senior observer may deduct more points than are assigned. The senior observer obtains the final grade for the exercise by subtracting points lost from 100.

SECURITY

Any action resulting in a reportable security violation, or any action, if not stopped or prevented by an observer, that would have resulted in a reportable security violation will cause an exercise to be evaluated as unsatisfactory. No numerical grade will be assigned, and the exercise will be canceled at that point. Report violations through the chain of command. The reporting of a security violation can be as low as operator or as high as supervisor.

All nonreportable security violations will result in the loss of five points of credit. Three or more of these nonreportable violations will result in grading that exercise unsatisfactory. Examples of nonreportable violations are classifications not in letters larger than

the text on a page and improper classification of extracts.

COMPREHENSIVE COMMUNICATIONS ASSESSMENT

The Comprehensive Communications Assessment exercise (CCC-27-SF) evaluates the ship's overall communications in a three-phase evolution. This exercise requires the combined efforts of both signal and radio personnel to research operation orders (OPORDs) and plan all the communications requirements. The shipboard communications plan can be developed for an actual operation or a constructive facsimile, depending on the OCE's requirement.

COMMUNICATIONS PLAN

A ship's *communications plan* lists all the communications requirements in detail for a specific operation covering a specified period of time. It contains all the sequential information required for operations and communications personnel to achieve the communications commitments of a ship. The department/division officers, leading petty officer, and supervisors research effective OPORDs for communications requirements and combine them into an effective plan that can be carried out by the working personnel.

WARTIME PROVISIONS FOR VISUAL SIGNALING

Chapter 16 of NWP 4 contains procedures to change from peacetime communications procedures to wartime communications procedures or for other emergencies. Provisions of the chapter are carried out by the Chief of Naval Operations, who issues the directive "Execute Chapter Sixteen NWP Four." Immediately upon receipt of the directive, commanders must begin the measures indicated in that chapter.

Stipulations of chapter 16 of NWP 4 are classified; therefore, they cannot be covered in this text.

STANDING ORDERS

LEARNING OBJECTIVES: Identify standing orders. List personnel responsible for standing orders and the reason for having standing orders.

Because individuals differ, each leading Signaller runs his or her signal team, differently. All good Signalmen carry out all orders received and follow standard organization closely. There will also be variations in how individuals accomplish certain tasks. In addition to differences in personalities of leading Signalmen, the types of individuals that make up a signal team have a bearing on the way the leading Signaller performs. As the leading Signaller, you must be able to explain your way of doing tasks to all subordinates clearly. You should use standing orders containing personal instructions on what will be required. Read these orders to each member, and get a signature acknowledging his or her understanding. You must then hold all hands responsible for following all provisions of your orders.

When a period of several months is involved, a written order obviously is more effective than a verbal order. It also is superior because a group, if told to do something, can easily misunderstand. A few members of the group will interpret the verbal order one way, and some will interpret it another way. A written order with a verbal explanation eliminates doubt and confusion, and leaves no excuses for failure to follow.

Standing orders for the organization, administration, and function of the signal team must have the signature of the communications/signal officer. The leading Signaller is responsible for preparing these orders in the rough and submitting them to the division officer for approval.

Before writing standing orders, determine what directives exist. Review orders written by a predecessor and discuss any changes or comments with the division officer.

Standing orders must agree with the ship's and the department's organization books. Depending on the completeness of the latter book, it may not be necessary to prepare standing orders. Some departmental organization books are a list of standing orders in various divisions in the department. Standing orders could, therefore, be either a supplement to previously issued department organization orders or an actual part of that department's written organization.

As previously stated, standing orders should be explained fully to all hands. A record of signatures should be kept to show that each member has read and understands these orders. Standing orders should also be read and explained when new personnel report on

board. It would be a good idea to read some of the standing orders every few months at morning quarters.

Where practical, standing orders should be posted so they will be visible to all the team. You should personally make sure that one copy each of the ship's organization book, ship's orders (and regulations), operations department organization book or standing orders, and *the Uniform Code of Military Justice* are always available in the living compartment. You can secure these books by a chain with the watch, quarter, and station bill.

As the leading Signaller, do not make the mistake of having an excellently written organization standing order and then fail to follow through. Require compliance with these orders. Point out instances where failure to follow orders created problems. It is far better to have one good standing order that everyone follows than to have ten that are ignored.

Remember that conditions change. You can develop good standing orders and have them obeyed, but they will lose their value or effectiveness if they are not revised as new situations arise. To help you in preparing adequate standing orders, refer to figure 14-1. Note that it bears the number 2-92. That means it is the second standing order for the year 1992.

OPERATION ORDERS AND PLANS

LEARNING OBJECTIVES: Identify the sections of operation orders and plans. Explain the procedure for preparing operation orders and plans.

Operation orders (OPORDs) and plans (OPLANs) are designated to help the signal bridge personnel in performing their duties. This section explains OPORDs and OPLANs.

OPERATION ORDERS

Before the start of underway periods, all signal bridge personnel should be familiar with the communications portion of the OPORD or the letter of instruction (LOI). The leading Signaller obtains these orders from the communications/signals officer. Due to the few copies available, the needed information may be extracted. At the minimum, a list showing the task organization, schedule of events, and call signs should be on the signal bridge. Whenever possible, the leading Signaller of the ships assigned to the task organization should arrange a meeting for

a pre-underway brief. During this brief, information covering visual communications, use of call signs, and drills should be discussed. You gain an advantage by discussing these items before sailing.

Changes to OPORDs are issued frequently. Therefore, the leading Signaller must consult the OPORD often to make sure the signal team is kept up to date on any such changes.

OPORDs are issued to effect the coordinated immediate or near-future execution of an operation. They are prepared in a standard approved format, as stated in NWP 11, *Naval Operational Planning*.

An OPORD is a basic plan and usually consists of the heading, body, ending, and (as needed) detailed procedures (in the form of enclosures called annexes and appendices). The basic plan is concise, and contains only details necessary for a clear, overall picture of the operation. Annexes themselves may be short or long. They often have appendices and tabs to elaborate on the many details to be considered in a large and complicated tactical operation.

The most important portion of the OPORD (for communications personnel) is the communications annex. This annex gives information on communications that is too extensive to be included in the basic OPORD.

The amount and type of information in a communications annex depends on the purpose of the plan or order and on the mission of the command.

OPERATION PLANS

An OPLAN is a directive for carrying out an operation or a series of operations extending over a large geographic area. The plan usually covers a considerable period of time and is prepared well in advance. The plan may include information on the time it will become effective, or it may merely state that it will become effective when signaled by appropriate authority. The operation plan is the instrument upon which subordinate commanders base directives to their commands covering specific tasks assigned. Usually an OPLAN is designed to deal with some future situation or condition which may or may not come about.

For more information concerning OPORD and OPLANs, refer to NWP 11, *Naval Operational Planning*.

COMMUNICATIONS OFFICER'S ORDER NUMBER 2-92

From: Communications Officer

To: All visual signal personnel

Subj: DUTIES OF THE SIGNAL SUPERVISOR

1. You, as the signal supervisor, during your watch must be in complete control of the signal personnel on watch and of the signal material in use. You must ensure that a proper lookout is kept by your watch at all times, taking care that your watch does not congregate. You must concern yourself primarily with carrying on the signal activities and maintaining discipline, and secondarily, as necessary, with operating. You are responsible for seeing that instructions for the internal routing and filing of messages applicable to the signal section are complied with. During your watch you are required to do the following:

- a. Make sure that an alert watch is maintained at all times.
- b. Coordinate and supervise the operations and activities of the watch in such a way as to maintain efficiency in handling visual traffic with a minimum of noise and confusion.
- c. Be familiar with *the Allied Maritime Tactical Signal and Maneuvering Book*, *Visual Call Sign Book*, and all applicable instructions pertaining to visual communications.
- d. Be thoroughly familiar with the *International Code of Signals* and the procedures for communicating with merchant ships.
- e. Be familiar with combined and joint communication instructions and publications with respect to visual signaling.
- f. Know the recognition and identification signals in effect.
- g. Be proficient in all forms of visual communications, including drafting messages for transmission in any visual system.
- h. Keep yourself and the watch informed of the disposition, organization, formation, and location of all units in company.
- i. Know the responsibility of your ship for relaying and repeating visual signals and messages.
- j. Be responsible for safeguarding all communication publications on the signal bridge.
- k. Conduct effective training and instruction for the Signalmen on every watch, unless operating condition positively prevent it.
- l. Be responsible for the cleanliness and orderliness of the signal bridge and the personnel on watch.
- m. Thoroughly familiarize yourself and your watch with the location and use of emergency signal equipment including pyrotechnic kits and pyrotechnics.
- n. Acquaint yourself and your watch with the duties in the various emergency bills, with particular emphasis in the man overboard bill.

2. You, as the signal supervisor, are responsible for maintaining the visual signal log.

a. The visual signal log must contain a record of *all signals* from the *Allied Maritime Tactical Signal and Maneuvering Book* and/or other signal books as sent or received. The date, time of execution, originator, addressees, method by which signals are sent or received, and the signal itself, but not its meaning, must also be included in the log. It also includes identification data on all other visual traffic and all noteworthy events that affect the visual watch, such as relieving the signal watch, exchange of calls, casualties to visual equipment, and the like. The record must remain on the signal bridge in custody of the signal supervisor, and must be signed by the supervisor upon being relieved of the watch. The visual log must be kept with a new page starting at the beginning of each radio day.

Figure 14-1.—Standing order sample.

b. The method of transmission must be logged on all messages as follows:

<u>Abbreviation</u>	<u>Meaning</u>
FH	Flaghoist
FL	Small signal searchlight
SL	Large signal searchlight
BK	Yardarm blinker
SEM	Semaphore
NFL	Infrared directional
NBK	Infrared nondirectional
MPL	Multipurpose light

c. Any signal requiring action other than that demanded by the immediate tactical situation should be written up and handled as a regular message, with the additional logging of the signal in the visual log.

d. Messages and signals having a specified time of execution are given the same routing and handling as in the preceding step. (Includes message being written on message blanks.) A copy of all tactical messages goes to the OOD for filing; one copy is kept by the supervisor as a safeguard against loss; remaining copies are sent to the communication center. The original, after it is initialed by the CWO, is returned to the visual file.

e. Emergency messages, including executive method, abbreviated plaindress, and high-priority precedence messages, are accorded the normal routing to the communication center only after the signal force notifies the person(s) concerned.

3. In port, the duty Signalman/signal supervisor will man the signal bridge as required to perform the inport signal functions as outlined in signal publications and SOPA instructions.

Submitted:/s/J.A. DOE, ENS, USN
Communications Officer

Approved:/s/J.K. FROST, LCDR, USN
Ship Control Officer

Figure 14-1.—Standing order sample—Continued.

SUMMARY

In this chapter, you learned the procedures used for grading and critiquing visual drills and exercises. You learned about the grade sheets and where to locate

these sheets. We also discussed standing orders and the effect they have on the signal team, the difference between OPORDs and OPLANs and the wartime provisions for visual signaling. Now it is up to you to put what you have learned to use.

APPENDIX I

GLOSSARY

ABEAM—Bearing 90° or 270° relative from own ship.

ACP—Allied Communications Publication.

CELESTIAL NAVIGATION—Navigation with the aid of celestial bodies.

CLASSIFICATION—The determination that official information requires, in the interest of national security, a specific degree of protection against unauthorized disclosure, coupled with a designation signifying that such a determination has been made.

CODRESS—Message having the address buried in the encrypted text.

COMMISSION PENNANT—A long, narrow, starred and striped pennant flown aboard a commissioned ship.

CONVOY—A number of merchant ships or naval auxiliaries, or both, usually escorted by warships and/or aircraft, or a single merchant ship or naval auxiliary under surface escort, assembled and organized for the purpose of passage together.

DAYSHAPES—Shapes specified in both International and Inland Rules of the Road to visually indicate particular operations or situations from one vessel to another.

DEBARKATION STATION—The place on a ship where personnel assemble to debark in boats.

DECLASSIFICATION—The determination that in the interest of national security, some classified material no longer requires any degree of protection against unauthorized disclosure, coupled with removal or cancellation of the classification designation.

DEFENSE MAPPING AGENCY—Government agency that produces and sells navigational charts and publications.

ENCODE—To convert plain text into unintelligible language, usually word by word, by means of a code book

FATHOM—A unit of length equal to 6 feet.

FLAGHOIST—A nondirectional means of transmitting signals with predetermined meanings taken from authorized publications. The U.S. and Allied Navies use 68 different flags/pennants or combinations thereof for this purpose. International use consists of 40 different flags and pennants.

FLASHING LIGHT—The term applied to the transmission of signals by light. The equipment employed may be directional or nondirectional in operation. The use of directional flashing light reduces the possibility of its interception, thus providing some security. When security is required at night, only highly directional flashing light should be used and its brilliancy should be the minimum necessary to provide communication. Nondirectional flashing light permits simultaneous transmission to a number of stations in any direction but has little security from interception, particularly at night.

FORETRUCK—The highest point of the forward mast.

FORMATION—Any ordered arrangement of two or more ships or aircraft proceeding together.

FUSELAGE—The body of an airplane.

GAFF—A small spar abaft the mainmast from which the national ensign is flown when the ship is underway.

GIVE-WAY VESSEL—As directed by Rules of the Road, any vessel required to keep out of the way of another vessel.

GNOMONIC PROJECTION—A map projection in which points on the surface of a sphere or spheroid, such as Earth, are conceived as projected by radials from the center to a tangent plane.

GREENWICH MEAN TIME—Local mean time at the Greenwich meridian; the arc of the celestial equator, or the angle at the celestial pole, between the lower branch of the Greenwich celestial meridian and the hour circle of the mean sun, measured westward from the lower branch of the Greenwich celestial meridian through 24 hours;

Greenwich hour angle of the mean sun, expressed in time units plus 12 hours.

GUIDE—Vessel designated in a formation or disposition as the one for others to keep station on.

GUN SALUTE—Blank shots fired to honor a dignitary or in celebration.

H-HOUR—The term used to designate the time for an operation to commence.

HEAD-ON VESSEL—One vessel meeting another on a reciprocal or nearly reciprocal course involving risk of collision.

HOIST—To move an article vertically upward by means of some hoisting rig.

HULL DOWN—Said of a vessel when, because of distance and curvature of Earth, only the superstructure is visible.

INFRARED—Transmission of signals by light outside the visual spectrum. This method, which may be directional or nondirectional, necessitates the use of special equipment and affords greater security than normal visual means.

IRISH PENNANT—A loose end of line carelessly left dangling.

JANAP—Joint Army-Navy-Air Force Publication.

LATITUDE—Distance north (*N*) or south (*S*) of the equator, expressed in degrees and minutes.

LONGITUDE—Distance east (*E*) and west (*W*) of the prime meridian, which runs through Greenwich, England.

LORAN—An electrical navigation system by which hyperbolic lines of position are determined by measuring the differences in the time of reception of synchronized pulse signals from two fixed transmitters.

MANEUVERING BOARD—A polar coordinated plotting sheet devised to aid in the solution of problems involving relative movement.

MASTHEAD LIGHT—The white running light placed over a vessel's fore-and-aft centerline showing an unbroken light over an arc of the horizon of 225°, fixed to show the light from right ahead to 22.5° abaft the beam on either side of the vessel.

MEAN TIME—Time based upon the rotation of Earth relative to the mean sun.

MERCATOR PROJECTION—A conformal cylindrical map projection in which the surface of a sphere or spheroid, such as Earth, is conceived on a cylinder tangent along the equator.

MESSENGER—(1) A line used to haul another heavier line across an intervening space; (2) One who delivers messages.

NEED-TO-KNOW—A criterion used in security procedures that requires the custodians of classified information to establish, prior to disclosure, that the intended recipient must have access to the information to perform his/her official duties.

NIGHT VISION DEVICES—Precision instruments that use electronic optics for observation, surveillance, and navigation. Also referred to as Night-Vision Sights.

NTP—Naval Tactical Publication.

NWP—Naval Warfare Publication.

OCCULTING LIGHTS—A navigational aid in which the period of light is equal to or more than the period of darkness.

OCCUPATIONAL STANDARDS—The minimum requirements for enlisted occupational skills of a certain rate or rating.

OFFICIAL INFORMATION—Information that is owned by, produced by, or subject to the control of the United States Government.

OFFICIAL VISIT—A formal visit of courtesy requiring special honors and ceremonies.

OMEGA—An electronic navigational system.

PELORUS—Device for taking relative bearings.

PERSONNEL QUALIFICATION STANDARDS—Qualification for officers and enlisted personnel to perform certain duties.

PHYSICAL SECURITY—That part of security concerned with physical measures designed to safeguard personnel; to prevent unauthorized access to equipment, installations, material and documents; and to safeguard them against espionage, sabotage, damage, and theft.

POSITION ANGLE—The number of degrees an object seen in the sky is above the horizon.

POWER-DRIVEN VESSEL—Any vessel propelled by machinery.

PRECEDENCE—The relative order in which naval messages are to be handled and delivered.

PYROTECHNICS —Ammunition containing chemicals that produce smoke or a brilliant light in burning; used for signaling and illumination.

QUICK-FLASHING LIGHT—A navigational light, such as a lighthouse, that flashes continually at least once a second.

RADIOTELEPHONE (R/T)—Used by ships and aircraft as the primary method for voice tactical and administrative communications.

RELATIVE BEARING—Bearing relative to heading or to the ship.

SAILING DIRECTIONS—A book issued by the Navy Department to supplement charts of the world. *Sailing Directions* contains descriptions of coastlines, harbors, dangers, aids to navigation, and other data that cannot conveniently be shown on a chart.

SECURITY CLEARANCE—An administrative determination by competent authority that an individual is eligible, from a security standpoint, for access to classified material.

SEMAPHORE—May be considered directional or nondirectional; however, nondirectional

procedures are used during transmission. This method uses small hand flags during daylight hours and wands fitted with red lenses during hours of darkness. The position or movement of the flags represents letters.

SIDELIGHT—A running light showing green to starboard and red to port, showing an unbroken light over an arc of the horizon of 112.5°, fixed to show the light from right ahead to 22.5° abaft the beam on the respective sides.

SOUND SIGNALING—The use of sirens, whistles, bells, and similar devices used to transmit short messages normally consisting of prearranged signals. Such methods are slow and satisfactory for short messages only; they are usually confined to warning or alert signals.

STANDARD OPERATING PROCEDURES (SOP)—Guidelines tailored to the unique requirements of a signal bridge. These orders are drafted by the leading Signaller and approved by the communications officer.

VISUAL SIGNALING—The means of passing tactical and administrative traffic between ships within visual signaling range, and between ships and shore stations.

APPENDIX II

FLASHING LIGHT AND SEMAPHORE DRILLS

FLASHING LIGHT

LEARNING OBJECTIVE: List tips on sending and receiving flashing light and on light qualifications.

International Morse code, a series of dots and dashes representing letters and numerals, is the standard for all flashing light and radio CW communications. The original code system was worked out in 1832 by Samuel F. B. Morse.

You must know international Morse code before you can use flashing light equipment effectively. Figure AII-1 shows the alphabet, numbers, and punctuation with the code equivalent. Basically, the code consists of 44 sight patterns: 26 letters, 10 numerals, and 8 punctuation marks. Each sight pattern (mental picture) except for punctuation contains from one to five dots or dashes (dits or dahs) or a combination of both, representing a letter or numeral. Except for the left parenthesis and slant/oblique stroke, punctuation sight patterns consist of dots and dashes in groups of six.

Experience has proved that the best way for most communications personnel to learn code is by “wholes.” For example, the Radioman is taught to relate whole tonal sounds to characters. Similarly, the Signaller should learn by whole sight patterns. Don't break each character into dits and dahs that you have to count. Try, instead, to learn each character as a complete mental picture. When you see one dit and one dah, say and think the letter A. Don't count them one dit, one dah, and then conclude that it is the letter A.

The best tip you will ever get on how to be a good Signaller is this: **PRACTICE**—don't neglect it! Practice is the stepping-stone to success. When you see a good Signaller sending and receiving a message on the light, you can rest assured that he or she had plenty of practice.

Once you memorize the code, ask one of the more experienced Signaller to send to you, using a blinker card, a multipurpose light, or even one of the searchlights. For the first few times, have the sender

to tell you in advance what character he or she is going to send so you can get use to how that particular sight pattern looks. When you are reasonably sure you have the sight patterns memorized, ask the sender to send a character without telling you what it is, and you call out the character. If you miss, ask the sender to tell you at once what character it was and ask him or her to repeat it. After you gain considerable practice on individual patterns, have some code groups consisting of random characters sent to you. If you notice that you confuse a few characters with others or that you seem to miss them more often than the rest, devote more time to those characters.

Practice these code groups as starters:

AFARF	EBBEU	NSPNP	LMZLM
ARFQZ	FEKUG	RBAPU	GVMCD
UQIWT	EHoxA	YSFTI	KNPUR
UFIEI	IAZIP	CBRIE	ULXWK

You can make up all sorts of combinations yourself. Just be sure they are code groups, not ordinary words. At this stage of the game, there is a definite reason why you should not attempt plain language drills: You may fall into the habit of anticipating the rest of the word or even the next logical word in the text.

When you become really proficient in receiving code groups, only then should you progress to plain language. Even in these drills, try not to anticipate the next letter or word. You will be wrong more often than right, and you will find when you guess wrong you become confused and miss the entire word. Anticipating is a bad habit.

TIPS ON SENDING FLASHING LIGHT

After you become fairly adept at receiving, try sending code. You will find this phase a bit easier. Keep in mind, however, that there is a definite physical limitation to the speed with which flashing light can be sent and still be readable. Depending upon the skill of the operator, the 12-inch Navy signal searchlight can be used to send up to 15 words a minute.

NEVER SEND FASTER THAN YOU CAN RECEIVE. If you transmit a message at 10 words a

LETTER	NUMBER	
A _ _ _ _ _	1 _ _ _ _ _	
B _ _ _ _ _	2 _ _ _ _ _	
C _ _ _ _ _	3 _ _ _ _ _	
D _ _ _ _ _	4 _ _ _ _ _	
E _ _ _ _ _	5 _ _ _ _ _	
F _ _ _ _ _	6 _ _ _ _ _	
G _ _ _ _ _	7 _ _ _ _ _	
H _ _ _ _ _	8 _ _ _ _ _	
I _ _ _ _ _	9 _ _ _ _ _	
J _ _ _ _ _	0 _ _ _ _ _	
K _ _ _ _ _	PUNCTUATION (MORSE)	
L _ _ _ _ _	COLON _ _ _ _ _	
M _ _ _ _ _	COMMA _ _ _ _ _	
N _ _ _ _ _	HYPHEN OR DASH _ _ _ _ _	
O _ _ _ _ _	PARENTHESIS/LEFT	
P _ _ _ _ _	HAND BRACKET _ _ _ _ _	
Q _ _ _ _ _	PARENTHESIS/RIGHT	
R _ _ _ _ _	HAND BRACKET _ _ _ _ _	
S _ _ _ _ _	PERIOD OR DECIMAL	
T _ _ _ _ _	POINT _ _ _ _ _	
U _ _ _ _ _	QUESTION MARK _ _ _ _ _	
V _ _ _ _ _	SLANT/OBLIQUE STROKE _ _ _ _ _	
W _ _ _ _ _	PUNCTUATION (SEMAPHORE)	
X _ _ _ _ _	COLON _ _ _ _ _	OS
Y _ _ _ _ _	COMMA _ _ _ _ _	MIM
Z _ _ _ _ _	HYPHEN OR DASH _ _ _ _ _	DU
	PARENTHESIS/LEFT	
	HAND BRACKET _ _ _ _ _	KN
	PARENTHESIS/RIGHT	
	HAND BRACKET _ _ _ _ _	KK
	PERIOD OR DECIMAL	
	POINT _ _ _ _ _	AAA
	QUESTION MARK _ _ _ _ _	IMI
	SLANT/OBLIQUE STROKE _ _ _ _ _	XE

Figure AII-1.—Formation of characters in Morse Code.

minute, an experienced SM probably will reply at the same rate; but you will be out of luck if you can read only 6 or 7 words a minute. Speed, incidentally, does not imply noise. The shutters can be moved quickly without banging them up and down.

When you are first learning to send code by light, it is wise to increase the interval between characters and groups. The extra time enables the beginner to see each character in the proper time ratio. Moreover, the greater period between the characters and groups allows the mind to verify or realize what the eyes have seen. Practice reduces this reception time, and the periods can be decreased.

The period the shutter remains open for a dit or dah and closed between characters and groups, when sending by flashing light, is given in the following list. Note that the interval between dits and dahs is the same.

- A dit equals 1 unit of duration.
- A dah equals 3 units.
- The period between dits or dahs in the same character equals 1 unit.
- The period between two characters equals 3 units.
- The period between groups equals 7 units.

FLASHING LIGHT QUALIFICATIONS

Certain flashing light standards are required of the Signalman for advancement to the third and second class levels. You must demonstrate your ability to meet these standards before you are recommended for advancement. They are required as part of your performance tests, which must be taken for advancement in rating.

For advancement to Signalman 3, you must be able to transmit and receive code groups at six groups per minute, and plain language messages at an approximate speed of eight words per minute. (Five characters equals one group.)

For advancement to Signalman 2, you must be able to transmit and receive code groups at an approximate speed of eight groups per minute and plain language at an approximate speed of 10 words per minute.

Following is a series of Morse code drills. Practice each drill until you can send and receive it at the rate of 25 characters per minute before going on to the next exercise. To estimate the time required to attain that speed, divide the number of characters in each drill by 25. Drill 1, for example, contains 150 characters. Before going on to drill 2, practice drill 1 until you can send or receive it in 6 minutes.

Drill 1

GM7OH	JMOHI	GOMG7	MOJG7
HOMJG	07AMG	H4OJM	7GHOJ
MJ7GM	OH1JG	OMJ4H	OG1JH
MOIGJ	HOM4G	JHJO0	GMIHJ
HIGOM	JH7G7	H07GM	J4HJG
OMGIJ	H4MOG	JGHM7	GOJMH
GGJ40	MIJGH	4GMOG	JOGH4
OMGNI	OGM7A		

Drill 2

DOGJK	SK7MY	HMJOD	GSHKD
7M28J	YOSKH	SKDOH	MZGJK
87M0Y	MGJOH	G7S2K	DY7GO
J7MHD	SKG28	MJ7K0	G8SMR
DJH72	KYDS8	KGOMJ	SHD28
K7GO2	DKSJ4	280HY	7GKSD
HJDYM	HSK07	82GJH	DSK82
HOYMG	7D8KS		

Drill 3

EJZPH	U8IOA	YBMKW	7G085
SD3YB	KH5E5	PWJY7	JBK3H
YW7SD	EOGP5	W3BWP	ES5K2
YMOG7	HJKYO	B P 8 2 7	MGSDW
KHOP3	KSJME	W7G5B	B28YD
2POHB	5SKJM	OMOG2	KYJH7
8SDW3	YBEP5	7HJG0	MYK2D
P S 8 5 P	EB3WJ	PKWGY	MJW28
HOGKS			

Drill 4

6B82H	00QP3	5T4HY	FLEWY
WEMJO	GSK3P	OHYDL	JFB6Q
FNL08	KDJ07	KMGOP	3W5BE
OKYDS	LFNGJ	YS5WN	JKOBF
POLQN	5PEDS	87HJ2	GKY3W
BQ6FO	PWO96		

Drill 5

UJKLV	AHYQP	96WX4	JO9UC
A4XQO	6LS2G	WOHPW	6F7YM
W9NSD	NGMJB	CUPEX	QKOH6
YOXC3	POH7G	5BA94	HUWEM
J28N6	QOSKY	EDLF8	X4ACU
FQ7LN	C0536	PBW5G	7HJOM
8DSKY	2DNQL	6JP9C	AW6YF
AN8PV	PW096		

Drill 6

This exercise contains all the letters of the alphabet and the 10 numerals. On completing this drill, you should be proficient in receiving all 36 characters when transmitted at the rate of 25 characters per minute.

JH7K2 YDLRI ITF9X 40WEM
JUG8S D0QZT VACU3 P0HSN
OL6B3 G02KH 7JDS8 GYMLO
B5VEF Q6N3W IZPCA UIPR9
X4JH7 2KTM0 G6SDE P5NPL
W3B80 UCTVZ 14X9B AIJPQ
IFZLD YKSOQ ITRV6 N82G7
B5A9X G39PH QJMBW U4YJO
ZXGPK RVZQO J2ENU VHKPO
CZ7Y5 LAIM8 W65RI GSKE4

A single word is considered five characters. You should now be able to send or receive at the rate of five words per minute. Let's go on to drill 7 and find out whether you can.

Drill 7

Practice drill 7 until you can send or receive it in 15 minutes. By then you will have attained a solid speed of 25 characters per minute.

0 P K H V U N E 2 J O Q Z V R
K P G X Z O J Y 4 U W B M J Q
H P 9 3 G X 9 A 5 B 7 G 2 8 N
6 V R T 1 Q 0 S K Y D L Z F 1
Q P J 1 A B 9 X 4 1 Z V T C U
0 8 B 3 W L Q N 5 P E D S 6 G
0 M T K 2 7 H J 4 X 9 R P I U
A C P Z 1 W 3 N 6 Q F E V 5 B
X J 7 F 9 K T 2 Y 1 I D R L H
T 4 Z O Q U E 0 M D J S W U 8
3 V B A 6 C L U O 3 N P 5 O H
0 G L O M K Y 2 G 7 H 8 S J D
A B C 5 P V Z E 1 J W Q 3 N 6
0 U M I T P K R 2 H 7 X 4 J 9

0 G 8 B 6 S 3 D W L E Q P 5 N
Q U C T P V I Z A 1 B 4 J X 9
6 1 V F R Z T L 1 D Q Y 0 K S
0 L M Y G 8 S D J 7 H 2 O K G
3 B 6 L O N S H O P 3 U C A V
T Z Q O D S 8 G U J M E W O 4
X 9 F T I 1 R L D Y 2 K 7 H J
H 8 P 2 G 9 C 3 X 7 B 5 A 9 N
K Q P J G M X B X W O U J 4 Y
0 R P V K Z H Q O V J U 2 N E
I C R 7 2 4 Y 6 W 5 L 8 M 1 A

With 5 words per minute accomplished, we will now try to boost your speed.

Drill 8

Practice drill 8 until you can send or receive at the rate of 30 characters (6 words) per minute.

B1EF6 EQ3MY 7ADQC 31PXZ
AVDTS 61ZNA 5NTON J8SW5
BGWHG 9ZM2C 9LUFD 9PW1Y
8LD4H DK700 3UY4K 7WJVX
IZG4R 2XA0H S5Q06 RCMTV
JW7K0 1RUP0 LF8V2 MZ9GF
8LY1I X5NOP T3UHC S6B4Q
IRDZE 7QVGF UL9C4 GZIXO
Q5SHM 6ET8D IRY23 PNJWB
2V9Y4 RIN95 WFKOM EJ70X
S8L0Z 5XPUT M6CR0 N5XI4
T3Q10 2K7HP A8O0D 6BVFK
A1LUT D3HBA 2GWEC U3SQ4
Z6B7D H8AKH

Drill 9

Practice this exercise until you can send or receive 35 characters (7 words) per minute.

B2V9Y HXLB1 1HBXL 0E7YA
LIXHB 4RIN9 16NDU U1D6N
DPB1T NU6ID 5WFKO 75ZGF
F7G5Z CR2JM ZF7GH MEJ70
08THE EOH8T 04VSW TE8OH

Drill 9

XS8LO	G3UCA	AGC3U	Q3YKA
UA3GC	Z5XPU	A0YE7	7AEQY
ORVG6	PWY7T	2H9NK	TD1BP
PTBDI	94NSK	1UXZR	31FQM
MCJR2	2MRCJ	2HDJL	ONQRV
GSJBV	WOS4V	VW40S	BAC31
SXTG5	YA3QK	5QEFA	QK3YO
2YIF8	RCWTV	Y2B9U	ZP5XP
1A6Z6	APZIP	XZU5I	9R4NK
2NIH9	H8L3U	3LHU8	N92KH
F0EM7	VG6SJ	CM494	MK9CQ
F3MIJ	0EM7M	3QIF0	7EBWB
EOW76	JGVS8	QSXLT	8WRC0
J4LDL	40DJW	C8TRD	6Z1PI
ZDP6Z	P6DIP	DL6S6	IPZDW
7TYPV	XZ812	DLS86	D9LWP
FAW9Q	XO3LA	7E0BP	KJE01
P92NX	IEGW2	6VQAL	U8TE3
VNY75	HRE46	8OXZG	OSXNM
SLD72	JWGWS	QJP8E	BIT4C
NCM8T	R5ALF	FKOVE	YWNMA
70JMK			

Drill 10

Practice drill 10 until you can send or receive it in 13 minutes if you are studying for advancement to E-4, and in 10 minutes for E-5. These rates are about 8 and 10 words per minute, respectively. Drill 10 is a quotation. Remember that when you receive, you should not anticipate. The intent of the drill is to build up your solid speed.

“All persons who in time of war or of rebellion against the supreme authority of the United States come or are found in the capacity of spies or who bring or deliver any seducing letter or message from any enemy or rebel or endeavor to corrupt any person in the Navy to betray his trust shall suffer death or such other punishment as a court-martial may adjudge. If any person belonging to any public vessel of the United States commits the crime of murder without the territorial Jurisdiction thereof he may be tried by court-martial and punished with death. All persons in the naval service shall be zealous in...”

SEMAPHORE QUALIFICATIONS

LEARNING OBJECTIVES: List the semaphore characters, including special signs, position drill, the system of opposites, and unnecessary movement. List tips on learning semaphore and the qualification needed for advancement.

For advancement to Signaller 3, you must be able to transmit and receive plain language semaphore messages at an approximate speed of 10 words per minute; and, for advancement to Signaller 2, to transmit and receive plain language at an approximate speed of 15 words per minute.

TIPS ON LEARNING SEMAPHORE

The “semaphore expert” achieved his or her reputation as a result of PRACTICE. The only pointers we can give you is the code itself and a few helpful hints gathered from the experts to assist you in meeting and surpassing the qualifications in our rate. The semaphore alphabet isn't at all difficult to learn. The speed at which you learn to send or receive it depends on how consistently you work at it.

First of all, take a look at figure AII-2. It shows how the semaphore alphabet and certain special signals used with it are formed by using two flags. As you memorize the positions for the various letters and signals, practice moving your arms quickly and surely to each of the various positions. The person in figure AII-2 is the sender, and you are looking at the illustration as though you are the receiver.

In figure AII-3, you see a man swinging through a position drill. He moves his flags smartly to their positions, using his arms from the shoulders. The flags form an extension of the plane of his shoulders. Notice that there is no mistaking his *B* for *A* or *C*, for example. Don't try for speed at first; that will come after you master the alphabet thoroughly. A sloppy sender not only spends time repeating messages because no one can read them, but also may cause the receiver to make a mistake on a word or a code group, resulting in the message having an entirely different meaning.

A single semaphore flag may be held in eight correct positions. You can picture these positions easily if you imagine yourself standing inside a circle

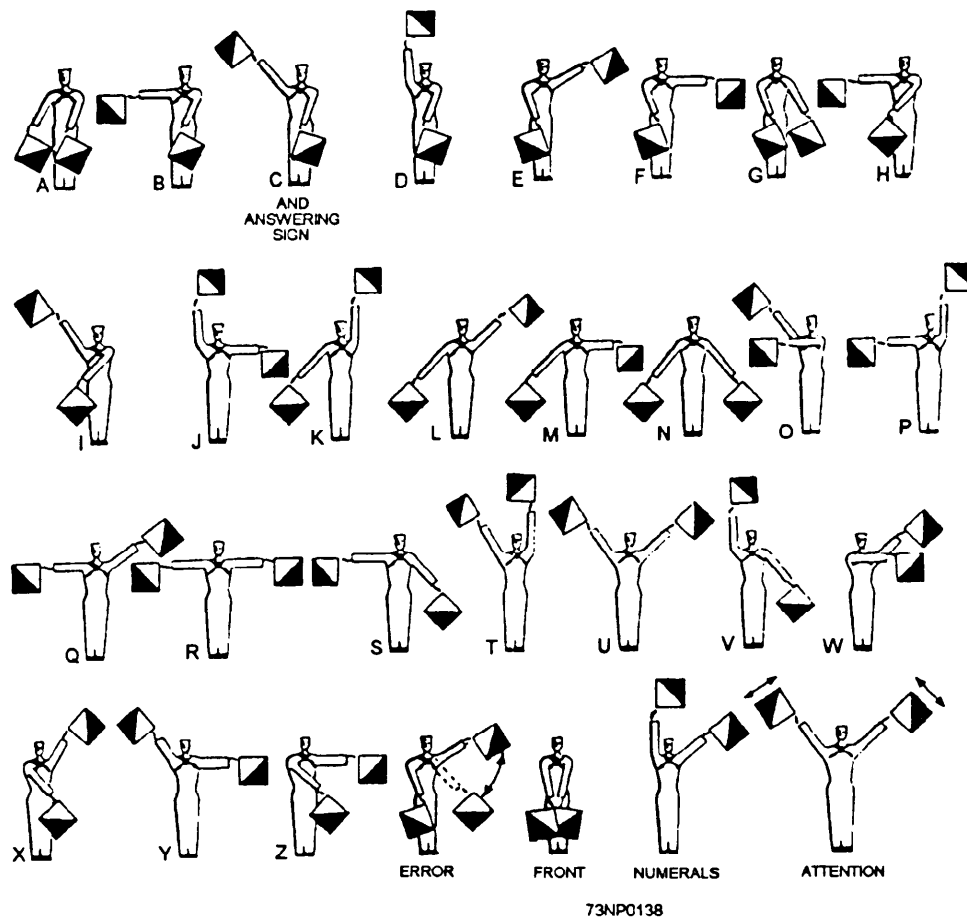


Figure AII-2.—Semaphore alphabet and special signals.

like the man in figure AII-4 Notice that the circle is divided into eight parts by equally spaced marks. These marks represent the correct flag positions. Anything between them is indefinite and will lead to confusion. Although one flag has only eight positions, innumerable combinations are possible when you use two flags as in semaphore. Of these possible combinations, 28 are used in semaphore communications. The semaphore alphabet is composed of 26 letters plus signs meaning NUMERALS and FRONT.

The FRONT sign is used after finishing a word. It is like the space left between words in ordinary writing. Also, it is used before and after each call sign, code group, operating signal, or prosign, and between all letters and numerals of a call sign. The NUMERAL sign is given just before you transmit a group of numbers or a group of mixed letters and numerals to be recorded in the text and counted as a single group. The sign is repeated when the group is completed.

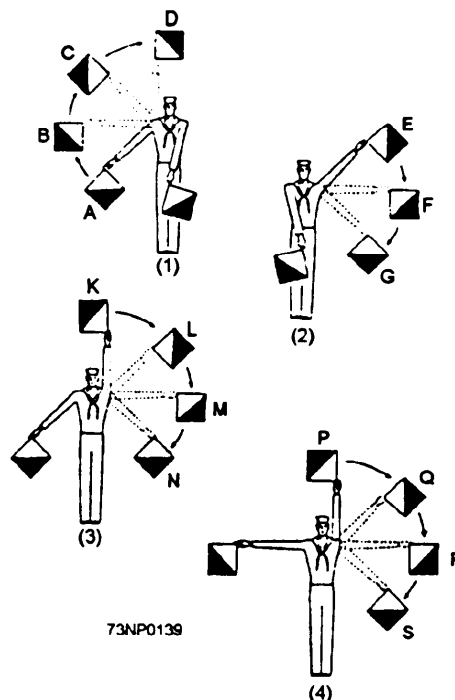


Figure AII-3.—Position drill.

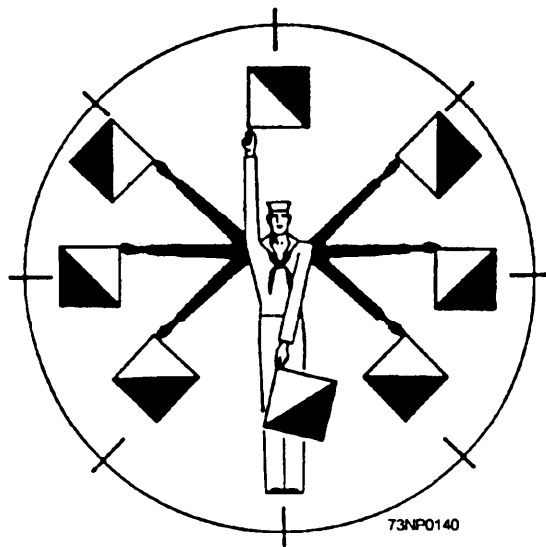


Figure AII-4.—Semaphore position circle.

Examining figure AII-2, you will see that *C* and *E* also are used as special signs. The ANSWERING sign is the same as letter *C*. The ERROR sign consists of letter *E* made eight or more times. ATTENTION is made by waving both flags from the horizontal to the overhead position.

The various instructors of semaphore in Navy schools teach different methods that they feel make learning easier. One of the most popular of these methods is the system of opposites. (See figure AII-5.) The idea here is to learn one letter, then learn a letter made by holding the hands in exactly the opposite position. Going down the list, you see that letters of the alphabet (except *L*, *D*, and *R*) have opposites that form other letters.

As you practice, move your arms from one position to another by the shortest route possible. Notice the movement of the man's arm(s) in figure AII-6 as he sends the word ships. Cutting out unnecessary movement of the arms makes your sending more uniform and increases your speed. As soon as possible, start sending and receiving with

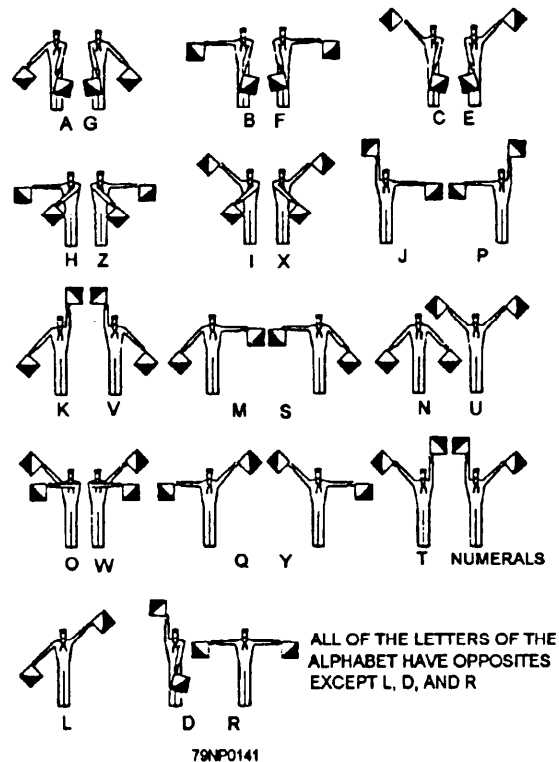


Figure AII-5.—The system of opposites

another striker. Always remember: Practicing correctly makes perfection.

The remainder of this appendix is devoted to semaphore drills for you to practice.

Drill 1

When you are able to send each letter of the alphabet easily and without hesitation, you are ready to start sending groups. Start with this exercise. Do not try for speed; that will come later.

**EGMGH RILCO MUCVX LXDIR
ZKOBW MGQEH WFKZO SMGDH
QFWRK LUIVN CIJQV HJEGO
APSIJ BRSPZ PAYTD SCIVN
MGQEH LSMYZ FXNUV BRSPA**

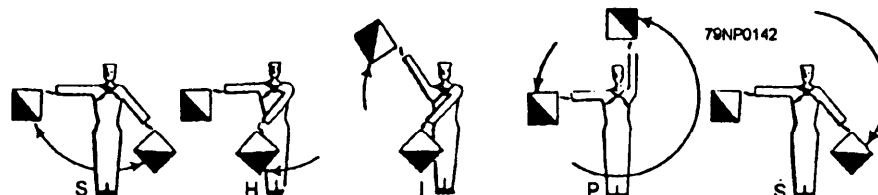


Figure AII-6.—Eliminating unnecessary movement.

Drill 2

Practice sending and receiving semaphore drill 2 using the front sign.

AGZMZ KGUGI LORPZ LAZLG
ISMFJ KOHZV CKEXQ BXQFY
FOTUB WBPYQ AYND S NAVTR
KWUGS ZECOK CHVTE LMPIB
CTEVH NCJIE VORSZ HWDNV
XQTCY RAHED GLKUM BORAX
SJXQM

Drill 3

Practice this exercise until you can send or receive at the rate of 10 groups per minute.

BQIZF ZGUZT BHM GV NBQIZ
HTEPD NKOYJ FAGLT RSKTB
MYKUC CEUDV ZQUHP MOWQE
GOJSX QTYYO ASCIQ RIPC G
VAWLR IKEJW XOJBV NRXPM
DAFJN IPURL RWAVL XOGJS
LYHSV FSCXR TEHDP JUMYC

Drill 4

Practice drill 4 until you can send or receive it without error in 5 minutes. This is a rate of 12 words per minute.

TWYJR MGLFU MFI ZE DLFMS
VDKPD BIZOE AHSKD TPCNV
WSAXH HNXAW JCTGL AOGBU
ECOZB BSPKV BUONX HKOWX
UIFLM RCJYT PWVRY EZJRY
LCPND MKSGU NEDRX RJBPC
QEISV TLFVR WMAOC QKSDA
MAWHR EXHDN FQLPK ULMZI
FZTUO IWOCY SYBVJ ETNWF
XVGKY QPBZJ TIGZU VOGXH
ETKDU LFISG RWCHJ VMQNX
LAQVG MBRWH NCXSI ODTYJ
PIGWU HZJOQ VBNRC AXKSD
WBRMH XCSNI TYDOQ ZEUPK
NCXWD OEYVF PGZUG QIBTJ

Drill 5

Practice drill 5 until you can send or receive it without error in 4 minutes. When you have accomplished this, you will have attained a rate of 15 words per minute.

SCSNI YD TOJ ZEUPK AFVQL
OEYVF PGZUH QIBTJ RKASL
ODWHY PGQUJ QIATL RKSBM
LORNP MKOXC INELG JPAWQ
TFSHO KUBVH YRZSU GSJDK
GMBUF TVAQX LEMPB QLROI
JDBEI YKZHT SCBVD UWJRQ
WXLHA NPOHM SOWQR BJLTM
NVKGX GDUIK VEZFH GOCAU
OBIPB QTRVP QFUKG IYIWY
WCXAI XAYFZ QHOML EPGNY
EFQAA FJZXD PUGWX FISKF
SDJRE JLSIR HJZMG FKASQ
MOEAM BNHMN BGQSC OIKLB
PCNHA KPDFE JLCGR PTRNI
THFYT STYEV

Drill 6

Practice drill 6 until you can send or receive it at the rate of 20 words per minute.

IFWTL PMBEV FWTLI VPMBE
DZLFG FCWRH JQUAA NWBKT
LIFWE VPMBA HLG YQ KHSVP
STCGE PKOZN ISTCG XNHRZ
STCGE PKOZN ISTCG XNHRZ
NWXAG ISUAH RSN GP LFDJA
YWUDK CGIST YPKHM EQBYD
IQYUE OTVYW TLIFB EVPMK
OPNGW RJFCU AHJQM ISFOI
QYUDP NGKOT VYELG YQH DJ
PTESF OMICL ZIESU AHISQ
ZTQGP RSNEQ NJXAG NWXUD
KYWPR SNGPH LVXXR VUCTQ
XWZRV UCXWZ TQSRU AZRZX
NHXVR TCFBM KZECL ZIAHJ
QUKAZ WB FOM ISIMI SFRJF
CWHLV XPQSW ZTBKD MOBYC

Drill 6

GMOLJ	DFDJA	LNJXE	QFGPR
WUDKY	XAGNW	KYWUD	DKYWU
JALFD	HRZXN	BYMEQ	PTEDJ
TEDJP	ZFBMK	TRCXV	CXVRT
QUAHJ	FCWRJ	BKANW	JQUAH
LIFWT	QNJXE	SNGPR	ISFOM
BMKZF	WXAGM	VPKHS	GISTC
GYSTC	TVYEO	QYUDI	VRTCX
CSXRV	DKMOB	EQBUM	LVXPH
FDOLJ	TGGIS	JFDOL	BYCGG
MBYCP	NGKOW	BKANG	KOPNC

WRJFN	WBKAM	KZFVZ	XHNRJ
PTEDL	ZIECU	OAZRI	ECLZK
ZFBMO	AZRUE	DJPTZ	IECLM
OBDKJ	XENYQ	HLGAL	FDJMB
EVZVU	CXRGN	WXAUD	IQYAH
ISUDJ	ALFOB	DKMHI	SUAYM
EQBTC	XVRZR	UOACG	MBYXE
QNJQH	LGYNG	KOPVH	RZXDE

Drill 7

Practice sending or receiving plain-language semaphore exercise 7 until you can do it in 5 minutes, or at the rate of 20 words per minute. For this seventh drill, work on the following quotation:

“Success of communication depends primarily upon knowledge of how, when, and where to send timely and intelligible messages and can be gained only through a common understanding on the part of those directly concerned in the vital business at hand. Communication personnel have an important place in the ship's organization. Only authorized frequencies should be used by the radio organization. Care must be exercised in the choice of a code or cipher for each message. The necessity for safeguarding visual traffic must not be overlooked. The use of standard phraseology or any external indications of...”

APPENDIX III

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